Phenomenon of the...

at room temperature. Diameter of the beam: 1.5 mm; current I: 6 ma; voltage V: 500 v. Fig. 3 shows the dependence of the activation on the previous treatment at a current I = 6 ma. There are 3 figures and 2 Soviet-bloc references.

ASSOCIATION: Institut yadernoy fiziki AN UzSSR (Institute of Nuclear Physics of the AS Uzbekskaya SSR)

SUBMITTED: May 28, 1960

Card 2/5

S/166/60/000/005/006/008
C111/C222

AUTHORS: Starodubtsev, S.V., Academician of the Academy of Sciences Uzbekskaya SSR, and Blaunshteyn, I.M.

TITLE: Radiolysis of Some Inorganic Combinations in the Field of an Intensive Gamma Radiation

PERIODICAL: Izvestiya Akademii nauk Uzbekskoy SSR, Seriya fiziko-matematicheskikh nauk, 1960, No.5, pp.77-80

TEXT: Pulverized and gaseous inorganic combinations were radiated by γ-rays of Co^{60} in a glass cylinder. The results are given in the following diagrams:

Card 1/5

S/166/60/000/005/006/008
C111/C222

Radiolysis of Some Inorganic Combinations in the Field of an Intensive Gamma Radiation

Fig.1

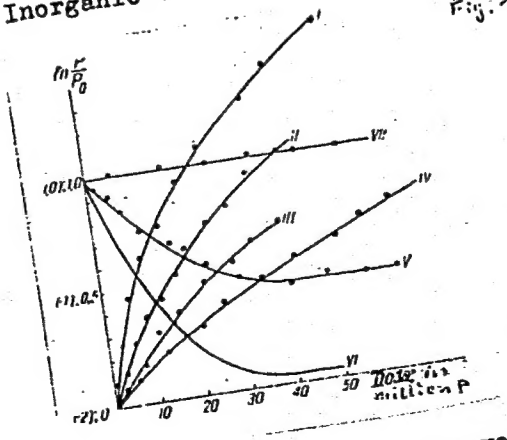


Fig.1: Relative change of the pressure in the volume for a radiation of the objects in dependence on the dosage of the radiation [for glass and quartz the coordinate origin is removed into the point (0.1)]:

Card 2/5

S/166/60/000/005/006/008
C111/C222

Radiolysis of Some Inorganic Combinations in the Field of an Intensive Gamma Radiation

I. Ba Cl_2(Cl_2); II Ba C O_3 (CO,O_2); III Mg O (O_2); IV Ba O (O_2), - the parantheses contain the composition of the gas separated during the radiation; V - Zn O; VI - Si O_2 powder; Na Cl, Cu Cl, glass.

Fig.2

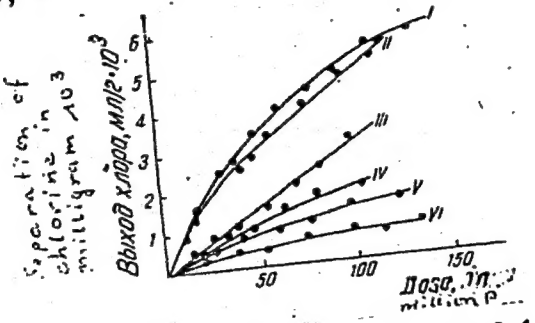


Fig.2. The dependence of the separation of gas of 1 gram of salt on the

Card 3/5

S/166/60/000/005/006/008
C111/C222

Radiolysis of Some Inorganic Combinations in the Field of an Intensive Gamma Radiation

dose of radiation for a decreasing (from I to VI) specific surface.

Fig. 3

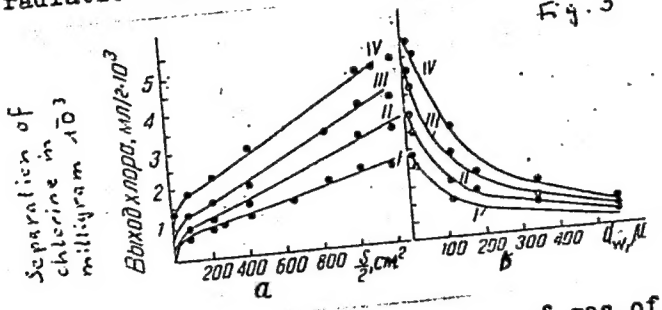


Fig.3. The dependence of the separation of gas of 1 gram of salt on the specific surface (a) and on the most probable diameter of the particles of a different order of magnitude (b) for the same radiation. The curves I,II,III,IV correspond to the radiation dosages 30, 50, 70, 100 million p. The complete results for Ba Cl_2 are given in the following table:

Card 4/5

S/166/60/000/005/006/008
C111/C222

Radiolysis of Some Inorganic Combinations in the Field of an Intensive Gamma Radiation

radiation dose million p	absorbed energy ev $\times 10^{-21}$	number of appearing chlorine molecules N $\times 10^{-16}$	separation of chlorine molecules per 100 ev of absorbed energy, $\theta \times 10^{3}$
30	1.14	6.17	4.30
50	2.40	9.25	3.85
70	3.37	11.80	3.55
100	4.80	13.90	2.88

There are 4 figures, 1 table and 9 references: 4 Soviet and 5 American.

ASSOCIATIONS: Fiziko-tekhnicheskiy institut AN Uz SSR (Physical-Technical Institute of the Academy of Sciences Uzbekskaya SSR)

SUBMITTED: July 9, 1960

Card 5/5

S/166/60/000/006/008/008
C111/C222

AUTHORS: Ablyayev, Sh.A., Yermatov, S.Ye. and Starodubtsev, S.V., Academician of the Academy of Sciences Uzbekskaya SSR.

TITLE: The Influence of the Gamma Radiation to the Adsorption Properties of Vacuum Materials

PERIODICAL: Izvestiya Akademii nauk Uzbekskoy SSR, Seriya fiziko-matematicheskikh nauk, 1960, No. 6, pp. 93 - 95

TEXT: In (Ref. 1) the authors showed that the adsorption properties of silica gel are changed essentially by γ - rays Co^{60}. The present paper is a continuation of (Ref. 1). The authors investigate the adsorption properties of the types KCK(KSK) and ACM(ASM) of the silica gel and of the alumosilicates. It was stated that the adsorbing capacity of the alumosilicates after a γ - radiation increases somewhat and the adsorbing capacity of the silica gel increases strongly.

Card 1/ 4

S/166/60/000/006/008/008
C111/C222

The Influence of the Gamma Radiation to the Adsorption Properties of Vacuum Materials

Fig. 1

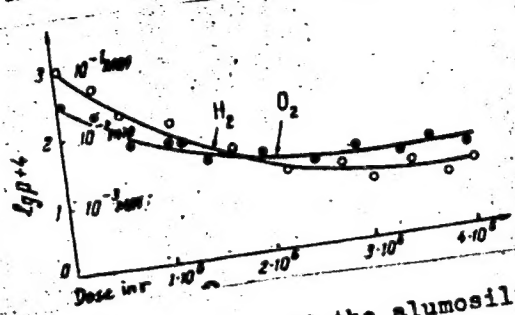


Fig. 1 : Change of the adsorbing capacity of the alumosilicates under the influence of γ - radiation.

Furthermore it was stated that for low temperatures of the tests the adsorption process is quicker.

Card 2/4

S/166/60/000/006/008/008
C111/C222

The Influence of the Gamma Radiation to the Adsorption Properties of Vacuum Materials

Fig. 2

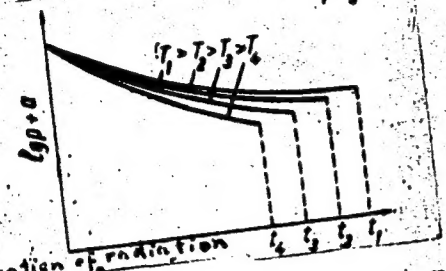


Fig. 2 : Influence of the temperature of the radiation to the velocity of the adsorption process.

The isothermal lines of the adsorption of the considered silica gel were obtained for two gases (H_2 and O_2) for room temperature and for the temperature of fluid nitrogen.
The discovered properties were used in order to construct a thermos bottle

Card 3/4

S/166/60/000/006/008/008
C111/C222

The Influence of the Gamma Radiation to the Adsorption Properties of Vacuum Materials

which contained silica gel between the walls and which was submitted to γ- radiation ; thereby it was reached that the velocity of cooling of the content was diminished essentially.
There are 6 figures and 1 Soviet reference.

[Abstracter's note : (Ref. 1) is a paper of the authors in Doklady Akademii nauk SSSR, 1959, Vol. 129, p. 72]

ASSOCIATION: Fiziko-Tekhnicheskiy institut AN Uz SSR (Physicotechnical Institute of the Academy of Sciences Uzbekskaya SSR)

SUBMITTED: August 29, 1960

Card 4/4

78333
SOV/89-8-3-18/32

21.8100

AUTHORS: Starodubtsev, S. V., Ablyayev, Sh. A., Generalova, V. V.

TITLE: Gamma-Ray Radiation Dosimetry Utilizing Changes in Optical Activity of Certain Hydrocarbons. Letter to the Editor

PERIODICAL: Atomnaya energiya, 1960, Vol 8, Nr 3, pp 264-265 (USSR)

ABSTRACT: Basic shortcomings of chemical dosimetric methods are their complicated nature, length of chemical processing after exposure, nonuniqueness, and low accuracy of results. The authors investigated radiation effects on solutions of saccharose and glucose with the aim of achieving a simple method which would also be sensitive to very large doses. In the water solutions used, the dosimetric property is the optical activity which varies under the influence of γ-radiations. The ChDA brand of glucose and saccharose was dissolved in doubly distilled water. 7 ml samples were irradiated by means of γ-rays of Co^{60} of 2.100 Curies of activity.

Card 1/4

78333
SOV/89-8-3-18/32

Gamma-Ray Radiation Dosimetry Utilizing Changes in Optical Activity of Certain Hydrocarbons. Letter to the Editor

The largest power used was 1.1 Mr/hr. Optical activity was measured by means of a sensitive polarimeter while doses were measured using the ferrosulphate or methylene blue method. Fig. 1 shows the typical variation of the angle of rotation α of the polarization plane in saccharose and glucose solutions with 45% (curve 1) and 20% (curve 2) concentrations. Measuring device was 10 cm long. Figure 2 represents the same relationship but in units, where $\frac{\Delta\alpha}{lC}$ - is the length of the light path and C the concentration. The simplicity of the investigation after exposure, wide range of doses (up to 10^8 or 10^9 r) and independence from the power of the dose induced the authors to recommend this method. Glucose seems to be the better material due to its better overall stability. In case of saccharose, the variation of angle of rotation is very much dependent on temperature, and increases very much with the increase in temperature. There are 3 figures; and 11

Card 2/4

Gamma-Ray Radiation Dosimetry Utilizing Changes in Optical Activity of Certain Hydrocarbons. Letter to the Editor

78355
SOV/89-8-3-18/32

references; 2 Soviet, 2 French, 2 U.K., and 5 U.S. The 5 most recent U.K. and U.S. references are: T. Hardwick, Canad. J. Chem., 30, 23 (1952); E. Weber, R. Schuler, J. Amer. Chem. Soc., 74, 4415 (1952); M. Day, G. Stein, Nucleonics, 8, Nr 2, 34 (1951); S. Goldblith, B. Proctor, Nucleonics, 7, Nr 2, 83 (1950); H. Andrews, P. Shore, J. Chem. Phys., 18, 1165 (1950).

SUBMITTED: October 21, 1959

Card 3/4

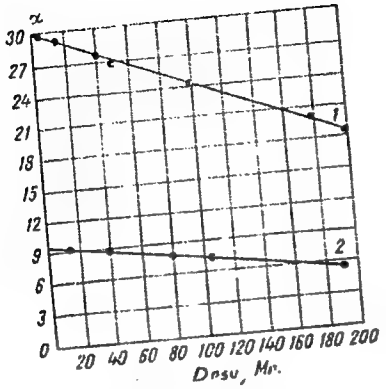


Fig. 1. Variation of the angle of rotation of the plane of polarization versus irradiation dose.

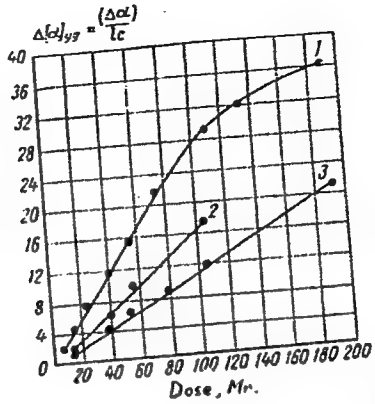


Fig. 2. Variation of the angle of rotation of the polarization plane of glucose solutions versus irradiation dose: (in %) (1) 5; (2) 10; (3) 20.

Card 4/4

STARODUBTSEV, S. V.

S/056/60/038/02/09/061
B006/B011

24.6600

AUTHORS: Makaryunas, K. V., Starodubtsev, S. V.

TITLE: Investigation of the Reactions (α,α'), (α,p), and (α,t) on Lithium Nuclei

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1960, Vol. 38, No. 2, pp. 372 - 378

TEXT: The investigations dealt with in the present paper were conducted on the cyclotron of the Leningradskiy fiziko-tekhnicheskiy institut (Leningrad Institute of Physics and Technology). α-particles with 10.15, 11.5, and 13.2 Mev were used for the experiments. A scattering chamber of 50 cm diameter was connected to the cyclotron, and the target was placed in its center; this was surrounded by photographic plates contained in special boxes. The plates were of the type Я -2 (Ya-2) with an emulsion thickness of 100 μ. The target consisted of metallic lithium in natural isotopic composition (0.75 - 1.1 mg/cm^2) and was situated in dry carbon dioxide. The plates were evaluated by means of a microscope of the type МБИ-3 (MBI-3); the track lengths were measured, and the

Card 1/4

82012
S/056/60/038/02/09/061
B006/B011

Investigation of the Reactions (α,α'), (α,p), and (α,t) on Lithium Nuclei

particle energy spectra as well as the angular distributions of the particle groups were determined. The deviations of the absolute values of the differential cross sections from the mean values did not exceed 30-40% in the various experiments. Results concerning the angular distributions of the various reactions are outlined in the paper under review. Angular distribution of reaction $Li^7(\alpha,\alpha')Li^{7*}$ ($Q = -4.61$ Mev): Fig. 2 shows the angular distribution of α-particles undergoing inelastic scattering on Li^7, at $E_\alpha = 13.2$ Mev. The cross section calculated from an integration of the angular distribution from 15 to 90° (in the center-of-mass system) was found to be 147 ± 60 mb. A comparison (Fig. 2) with Butler's theory (Ref. 3) shows that the parity of the 4.61-Mev level of the Li^7 nucleus is negative, and that it has a spin of 1/2, 3/2, 5/2, or 7/2 (ground state of $3/2^-$). Angular distributions of the reactions $Li^6(\alpha,p)Be^9$ ($Q = -2.13$ Mev) and $Li^7(\alpha,p)Be^{10}$ ($Q = -2.56$ Mev): Fig. 3 shows the angular distributions of protons originating from these reactions in the laboratory system

Card 2/4

82012
S/056/60/038/02/09/061
B006/B011

Investigation of the Reactions (α,α'), (α,p), and (α,t) on Lithium Nuclei

ASSOCIATION: Leningradskiy fiziko-tekhnicheskiy institut Akademii nauk SSSR (Leningrad Institute of Physics and Technology of the Academy of Sciences, USSR)

SUBMITTED: August 7, 1959

Card 4/4

Investigation of the Reactions (α,α'), (α,p), and (α,t) on Lithium Nuclei

at E_α = 10.15, 11.5, and 13.2 Mev, and Fig. 4 the angular distribution of protons in the center-of-mass system at E_α = 11.5 Mev. The angular distribution in the center-of-mass system is strongly anisotropic and asymmetric with respect to $\Theta = 90^\circ$. The angular distribution of tritons originating from the reaction $Li^7(\alpha,t)Be^8$ (Q = - 2.56 Mev) is shown for E_α = 10.15 Mev in Fig. 5, and also, for comparison, the distribution curve calculated according to Butler. A curve calculated according to the stripping theory is shown as well. It is very similar to the one of the knock-out theory. The authors finally thank the cyclotron team headed by A. B. Girshin, and also the collaborators of the laboratoriya yadernykh reaktsiy LFTI (Laboratory of Nuclear Reactions of the LFTI) for their assistance in the experiments. There are 5 figures and 14 references: 2 Soviet, 9 American, 1 British, 1 Japanese, and 1 Polish.

Card 3/4

84961

S/056/60/039/003/047/058/XX
B006/B070

24,6600

AUTHORS: Velyukhov, G. Ye., Prokof'yev, A. N., Starodubtsev, S. V.

TITLE: Capture Reaction on F^{19}, P^{31}, and S^{32} Nuclei

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1960, Vol. 39, No. 3(9), pp. 563 - 565

TEXT: The authors had established in Ref. 1 that the differential cross sections of the reactions $F^{19}(n,d)O^{18}$ and $P^{31}(n,d)Si^{30}$ coincide if the transitions to the ground levels of O^{18} and Si^{30} take place at E_n = 14.1 Mev. If it is assumed that this is due to the last protons of F^{19} and P^{31} being in the same state, a similar result should be expected for the reactions $Ne^{20}(n,d)F^{19}$ and $S^{32}(n,d)P^{31}$, since also in this case the last protons of Ne^{20} and S^{32} are in the same state ($2S_{1/2}$). To clear up this, the authors studied simultaneously the (n,d) reactions on F^{19},

Card 1/3

84961

Capture Reaction on F^{19}, P^{31}, and S^{32} Nuclei

S/056/60/039/003/047/058/XX
B006/B070

P^{31}, and S^{32}. For this purpose a new method was used, which is described in Ref. 1, and which makes possible a better separation of the deuteron group. The reaction $S^{32}(n,d)P^{31}$ was investigated on a target with natural isotopic composition and the deuteron energy spectrum determined. Fig. 1 shows this for an angle of emission of 0^0 in the laboratory system. Q was found to be equal to (-7.7 ± 0.1)Mev, and the differential cross section at 0^0 was $(20.4 \pm 1.5).10^{-27}$ cm^2/steradian. The differential cross section of the reaction $F^{19}(n,d)O^{18}$ at 0^0 was found to be $(21.4 \pm 1.1).10^{-27}$ cm^2/steradian, and Q = (-5.9 ± 0.3) Mev. The cross section of the reaction $S^{32}(n,d)P^{31}$ was found to be $(21.8 \pm 1.2).10^{-27}$ cm^2, and Q = (-5.2 ± 0.2)Mev. The deuteron angular distributions of these three reactions for $0-30^0$ are shown in Fig. 2. The reaction cross sections decrease rapidly with increasing angles. Finally, the authors discuss a calculation of the reduced transition widths according to Butler's theory. The angular distributions calculated theoretically agree with the experimental results for all of the three reactions at an interaction

Card 2/3

84961

Capture Reaction on F^{19}, P^{31}, and S^{32} Nuclei

S/056/60/039/003/047/058/XX
B006/B070

radius of $5.1 \cdot 10^{-13}$ cm. The authors thank A. P. Pulin and A. M. Tsvetkov for assistance. There are 2 figures and 3 references: 1 Soviet, 1 US, and 1 British.

ASSOCIATION: Leningradskiy Fiziko-tekhnicheskiy institut Akademii nauk SSSR (Leningrad Institute of Physics and Technology of the Academy of Sciences USSR)

X

SUBMITTED: April 16, 1960

Card 3/3

S/020/60/132/04/19/064
B014/B007

21.6200

AUTHORS: Starodubtsev, S. V., Academician of the AS Uzbekskaya SSR, Khiznichenko, L. P., Domoryad, I. A.

TITLE: The Change of the Constants of Elasticity of Quartz Filaments Under the Action of the Gamma Emission of Co^{60}

PERIODICAL: Doklady Akademii nauk SSSR, 1960, Vol. 132, No. 4, pp. 803-805

TEXT: The filaments investigated here by means of high-precision methods were produced from molten quartz. Determination of the constants of elasticity was carried out by means of torsional oscillations of the filament sample generated by a magnetic field. Two methods of recording the number of oscillations were tried out. In the case of one of them, the time signals of the Tashkentskaya astronomicheskaya observatoriya (Tashkent Astronomical Observatory) and the zero passages of the light beam reflected by the mirror of the loop oscilloscope were simultaneously recorded on the photographic film of a loop oscilloscope. With the other method, the oscillations per unit time were counted electronically, in

Card 1/3

The Change of the Constants of Elasticity of Quartz Filaments Under the Action of the Gamma Emission of Co^{60}

S/020/60/132/04/19/064
B014/B007

which case a chronometer was used. The second method was found to be more exact (error of 0.02%), and by means of this method the main results were obtained. Measurements were carried out with six radiation doses within the range of from $81 \cdot 10^6$ r to $845 \cdot 10^6$ r. Fig. 1 graphically shows the values of $\Delta G/G$ calculated from the measurements (G is the modulus of elasticity in shear) as dependent on the dose. In curve I the linear deformation has not been considered, whereas in curve II it has. Curve III shows the change of $\Delta l/l$ (l is the length of the filament). It was found that the modulus of elasticity in shear increases steadily with an increase in the dose; with a further increasing dose this increase becomes less. An increase in the modulus of elasticity by 0.16 ± 0.02 % was found with a dose of $8 \cdot 10^8$ r. The increase in the modulus of elasticity is explained by the occurrence of ordered domains in the structure of the molten quartz. There are 1 figure and 4 references, 2 of which are Soviet.

Card 2/3

STARODUBTSEV, S.V., akad., otv. red.; ABDULLAYEV, A.A., kand. fiz.-mat. nauk, red.; ABDURASULOV, D.M., doktor med. nauk, red.; ARIFOV, U.A., akad., red.; BORODULINA, A.A., kand. biol. nauk, red.; IVASHEV, V.N., red.; IKRAMOVA, G.S., red.; KIV, A.Ye., red.; LOBANOV, Ye.M., kand. fiz.-mat. nauk, red.; NIKOLAYEV, A.I., kand. med. nauk, red.; NISHANOV, D., kand. khim. nauk, red.; SADYKOV, A.S., akad., red.; TALANIN, Yu.N., kand. fiz.-mat. nauk, red.; TURAKULOV, Ya.Kh., doktor biol. nauk, red.; GAYSINSKAYA, I.G., red.; GOR'KOVAYA, Z.P., tekhn. red.

[Transactions of the Tashkent Conference on the Peaseful Uses of Atomic Energy] Trudy Tashkentskoy konferentsii po mirnomu ispol'zovaniiu atomnoi energii, 1959. Tashkent, Izd-vo Akad.nauk Uzbekskoi SSR. Vol.1. 1961. 410 p. (MIRA 15:5)

1. Tashkentskaya konferentsiya po mirnomu ispol'zovaniyu atomnoy energii, Tashkent, 1959. 2. Akademiya nauk Uzbekskoy SSSR (for Starodubtsev, Arifov, Sadykov). 3. Chlen-korrespondent Akademii nauk SSSR (for Sadykov). 4. Institut yadernoy fiziki Akademii nauk Uzbekskoy SSR (for Arifof, Lobanov). 5. Institut krayevoy eksperimental'noy meditsiny Akademii nauk Uzbekskoy SSR (for Turakulov).

(Atomic energy--Congresses)

STARODUBTSEV, S.V., akademik, otv. red.; GAYSINSKAYA, I.G., red.; SOKOLOVA, A.A., red.; KARABAYEVA, Kh.U., tekhn. red.

[Some problems in applied physics] Nekotorye voprosy prikladnoi fiziki. Tashkent, 1961. 107 p. (MIRA 14:7)

1. Akademiya nauk Uabekskoy SSR, Tashkent. Otdeleniye fiziko-matematicheskikh nauk. 2. Akademiya nak Uzbekskoy SSR (for Starodubtsev)

(Physics)

33080
S/638/61/001/000/002/056
B102/B138

21.1220 also 2209

AUTHOR: Starodubtsev, S. V.

TITLE: Study of the changes in the properties of matter in strong nuclear radiation fields

SOURCE: Tashkentskaya konferentsiya po mirnomy ispol'zovaniyu atomnoy energii. Tashkent, 1959. Trudy. v. 1. Tashkent, 1961, 26-34

TEXT: The author studies the effects which, in the interaction between γ-radiation and electrons with solids, will lead to permanent changes in their properties. These changes are due to the release of energy in the solid, causing the formation of, e.g., Frenkel' defects. All possible ways of releasing the energy necessary for the production of defects are discussed. The new formations observed in the solid are due to secondary processes, e.g. electrons which have formed as a result of the Compton or photoeffect in the material. Besides the new formations of ions, molecules, and radicals, excitation centers are also formed which may cause catalytic processes or chain reactions. The processes may be

Card 1/3

Study of the changes in the ...

divided into three groups: (1) Primary interaction between quantum and atom for $t = 10^{-18}$ sec; (2) Secondary processes which lead to the formation of slow electrons, excitation centers and molecular fragments, and which last some μsec. (3) Aftereffects which determine the physical and chemical properties of the system and which may last a few hours or a few years. The physical processes comprise electric and optical effects, and changes in dimensions and mechanical and surface properties. The chemical processes comprise destruction, formation of radicals, liberation of gas, and catalytic processes. If a biological substance is irradiated, biological processes occur which may be considerable at small doses. In the radiation physics laboratories of the Institut yadernoy fiziki (Institute of Nuclear Physics) and of the Fiziko-tekhnicheskiy institut AN UzSSR (Physicotechnical Institute of the AS Uzbekskaya SSR) a group has for a number of years been conducting methodological research studies in the fields of radiation physics. Amongst other things it was found that γ-irradiation of saccharose and glucose causes quite a considerable change in optical activity. Radiation effects are especially strong in semiconductors, those in Ge and Si being well-known. In CdS a large number of excitation centers are formed which disappear on IR-irradiation.

Card 2/3

33666
S/058/61/000/012/021/083
A058/A101

24.6600
AUTHORS: Starodubtsev, S. V., Khrushchev, B. I.

TITLE: Energy dependence of the angular distributions for B^{10} (d, p) B^{11} reactions

PERIODICAL: Referativnyy zhurnal, Fizika, no. 12, 1961, 113, abstract 12B595 ("Tr. Tashkentsk. konferentsii po mirn. ispol'zovaniyu atomn. energii", 1959, v. 1, Tashkent, AN UzSSR, 1961, 89-97)

TEXT: There were measured the angular distributions and integral cross sections of 4 long-range proton groups for the $B^{10}(d,p)B^{11}$ reaction at deuteron energies of 5, 5.75, 6.5 and 7.25 Mev. The angular distributions are analyzed in detail, and numerous data from other authors are adduced. Best agreement is found with the stripping theory taking into account exchange effects.

[Abstracter's note: Complete translation]

Card 1/1

33090
S/638/61/001/000/012/056
B102/B138

24.6400

AUTHORS: Starodubtsev, S. V., Makaryunas, K. V.

TITLE: Elastic and inelastic scattering of 13.2-Mev α-particles on lithium, and the reactions $Li^6(\alpha,p)Be^9$ and $Li^7(\alpha,p)Be^{10}$

SOURCE: Tashkentskaya konferentsiya po mirnomy ispol'zovaniyu atomnoy energii. Tashkent, 1959. Trudy. v. 1. Tashkent, 1961, 98-102

TEXT: The authors studied the Li-α interaction primarily to clarify the mechanism: of nucleus formation in which important parts are played by "direct" interaction such as stripping, pickup, knockout, inelastic processes. The various possibilities are thoroughly discussed. Experiments were conducted on the cyclotron of the Leningradskiy fiziko-tekhnicheskiy institut (Leningrad Physicotechnical Institute). 14-20 μ thick metallic lithium targets of natural isotope composition were bombarded with 13.2-Mev α-particles. The target was in the center of a 50-cm diameter scattering chamber designed by S. V. Starodubtsev, Ye. M. Lobanov, and I. M. Shcheglov. 20 cm from the target were 100-μ photo-

Card 1/3

33094

S/638/61/001/000/017/056
B104/B138

24.6600

AUTHORS: Velyukhov, G. Ye., Prokof'yev, A. N., Starodubtsev, S. V.

TITLE: Study of capture reactions of light nuclei with 14.1-Mev neutrons

SOURCE: Tashkentskaya konferentsiya po mirnomy ispol'zovaniyu atomnoy energii. Tashkent, 1959. Trudy. v. 1. Tashkent, 1961, 129 - 134

TEXT: The reaction $T(d, n)He^4$ was the neutron source for studying the reaction (n, d) with 14.1-Mev neutrons on a number of isotopes. The deuterons were accelerated to 260 Mev in a Cockcroft-Walton generator. The neutron yield was determined with a CsI(Tl) monitor measuring the α-particles from reaction $T(d, n)He^4$. The telescope consisted of a single chamber into which was placed the target of the test substance, the boron counters, the unseparated foils and the NaI(Tl) crystal. To study angular distributions the whole chamber could be rotated about an axis running vertically through the target. The chamber was filled with a gas mixture

Card 1/3

Study of capture reactions ...

composed of 95% K_2, 5% CH_4; pressure 150 mm Hg. Three reactions were studied: $F^{19}(n, d)O^{18}$; $P^{31}(n, d)Si^{30}$; $S^{32,34}(n, d)P^{31,33}$. Teflon (CF_2-CF_2) targets with a density of 5.1 mg/cm^2 were used for the first reaction. The neutron flux was $2 \cdot 10^9$ neutrons/cm^2. Red phosphorus deposited onto a platinum backing was used for studying reaction $P^{31}(n,d)Si^{30}$. Density was 4.45 mg/cm^2, neutron flux $2 \cdot 10^9$ neutrons/cm^2. The natural isotope mixture was used for studying reaction $S^{32,34}(n, d)P^{31,33}$. The target was made by depositing sulfur onto a tantalum backing. Results are tabulated. There are 5 figures, 1 table, and 14 non-Soviet references. The four most recent references to English-language publications read as follows: Thomas R. G., Phys. Rev., 97, 224, 1955; Glenn, Frye. Phys. Rev., 93, 1087, 1957; Carlson R., Phys. Rev., 107, 1094, 1957; Ribe F. L. Phys. Rev., 106, 769, 1957.

ASSOCIATION: Leningradskiy fiziko-tekhnicheskiy institut AN SSSR (Leningrad Physicotechnical Institute AS USSR)

Card 2/3

Study of capture reactions ...

Table. Measurement results.
Legend: (1) Reaction, (2) $\sigma(\theta)\cdot 10^{27}$, cm^2/sterad, (3) Q, Mev, (4) θ - angle at which the energy spectrum of the reaction products was taken, (a) authors' data, (b) data obtained by F. L. Ribe (Phys. Rev., 106, 769, 1957).

(1) Тип реакции	(2) $\sigma(\theta)\cdot 10^{27}$ $см^2$/стерад		(3) Q, Мэв		(4) θ°		lp
	(a) наши данные	(b) работа [10]	(a) наши данные	(b) работа [10]	(a) наши данные	(b) работа [10]	
$F^{19}(n, d)O^{18}$	26,2	24	— 5,9±0,08	—5,79±0,08	0,039	0,036	S
$P^{31}(n, d)Si^{30}$	32,5	—	— 5,2±0,2	—	0,051	—	S
$S^{32,34}(n, d)P^{31,33}$	—	—	— 7,7±0,1	—	—	—	S
$S^{32,34}(n, d)P^{31,33}$	—	—	—10,1±0,1	—	—	—	S

Card 3/3

33097
S/638/61/001/000/020/056
B104/B138

14,7100 (1134, 1153, 1454)

AUTHORS: Niyazova, O. R., Starodubtsev, S. V.

TITLE: Formation of activation centers in CdS single crystals by X-rays

SOURCE: Tashkentskaya konferentsiya po mirnomy ispol'zovaniyu atomnoy energii. Tashkent, 1959. Trudy. v. 1. Tashkent, 1961, 155-159

TEXT: The activation of CdS single crystals by X-rays, the migration of excited centers, and the deactivation of single crystals were studied. A steady current is quickly established if a single crystal is irradiated with a broad X-ray beam. This is due to uniform distribution of carrier and activation centers throughout the crystal. Irradiation of a local zone in the crystal center causes a slow current variation which largely depends on the previous history of the crystal: (1) If the crystal is pretreated with a broad X-ray beam, the current passing through the crystal quickly reaches its steady value; (2) If the crystal is not first irradiated, conductivity increases slowly in the course of some tens of

Card 1/3

Formation of activation centers ...

hours. At the beginning of X-irradiation, the weak roentgenoluminescence of some crystals caused a nearly inertial-free increase in the current passing through the single crystal when a voltage of 300 v was applied. This is due to the extinction of roentgenoluminescence by the electric field, which produces a narrower probe characteristic. The activation centers exist for several hours and migrate into the crystal. Since the electric field shows no essential effect on the migration of activation centers, they are bound to be electrically neutral. The activation level rises with the dose of local X-irradiation. If the excitation is sufficient the centers produce new ones while moving. The current in X-irradiation increases even more rapidly as the activation level rises. The excitation produced by irradiation can either be thermally extinguished or by exposure to infrared rays. The extinction is accelerated with increasing temperature. Equilibrium between the generation and annealing of activation centers is established even at 80 - 90°C. At -150°C, the crystal is no longer activated by irradiation. A discussion of results reveals that the activation is primarily caused by atomic diffusion within the crystal. Estimation of the rate of this kind of diffusion shows that

Card 2/3

Formation of activation centers ...

diffusion may lead to prolonged periods of current increase. There are 4 figures and 12 references : 7 Soviet and 5 non-Soviet. The two references to English-language publications read as follows: Frerichs R., Phys. Rev., 76, 12, 1 59, 1949; Broser I., Broser-Warminsky R., J. Phys. Chem. Solids., v. 6, p. 386, 1958.

ASSOCIATION: Institut yadernoy fiziki AN UzSSR (Institute of Nuclear Physics AS Uzbekskaya SSR)

Card 3/3

33661
S/058/61/000/012/015/083
A058/A101

21.7200 also 4112 3212

AUTHORS: Ablyayev, Sh.A., Generalova, V.V., Starodubtsev, S.V.

TITLE: Concerning gamma-dose measurement from variation in optical activity of carbohydrates

PERIODICAL: Referativnyy zhurnal. Fizika, no. 12, 1961, 70, abstract 12B230 (Tr. Tashkentsk. konferentsii po mirn. ispol'zovaniyu atomn. energii, 1959, v. 1, Tashkent, AN UzSSR, 1961, 159 - 163)

TEXT: Radiation effects in sugar and glucose solutions were investigated in the dose range 0-200 million roentgens. The coefficient of optical activity was monitored by means of a sensitive polarimeter. Results showed that the angle of rotation of the polarization plane decreases linearly with irradiation dose. The effect of concentration incident to this variation of the specific rotation was investigated. Glucose solutions are recommended as dosimetric liquids in view of their long preservability, the constancy of the changes that take place in them and their insensitivity to temperature.

[Abstracter's note: Complete translation]

Card 1/1

33099
S/638/61/001/000/022/056
B104/B138

5.4600 2209, 1273

AUTHORS: Blaunshteyn, I. M., Starodubtsev, S. V.

TITLE: Radiolysis of some inorganic compounds by intense gamma irradiation

SOURCE: Tashkentskaya konferentsiya po mirnomy ispol'zovaniyu atomnoy energii. Tashkent, 1959. Trudy. v. 1. Tashkent, 1961, 163 - 168

TEXT: The gas yield during γ-irradiation of $KMnO_4$, LiH, $CaCO_3$, $BaCl_2$, glass powder, quartz, and other materials, was determined in preliminary tests. Thermally stable $BaCl_2$ was most sensitive to X rays. Its gaseous radiolysis products were analyzed with a mass spectrometer. A weighed amount of $BaCl_2$ was sealed into a glass cylinder, and degassed by heating at 300°C for several hours. After sealing off pressure was $\sim 10^{-4}$ mm Hg. After several days it was irradiated with a Co^{60} source (330,000 r/hr). Maximum dose was 150 million r. $BaCl_2$ fractions were prepared by 40 - 81μ

Card 1/3

33099

S/638/61/001/000/022/056
B104/B138

Radiolysis of some inorganic ...

mesh screens. The authors determined the gas generation (Cl_2) as a function of particle size and dose, as a function of specific surface for one dose, and as a function of the most probable diameter of particles of various fractions. Results:

Dose, million r	Energy absorbed, $ev \cdot 10^{-21}$	Amount of chlorine molecules formed, $Cl_2 \cdot 10^{-16}$	Molecular yield per 100 ev absorbed energy, $N \cdot 10^3$
30	1.14	6.17	4.30
50	2.40	9.25	3.85
70	3.37	11.80	3.55
100	4.80	13.90	2.88

The reduction of gas generation with increasing dose is attributed to increased recombination in the presence of a large number of dissociated molecules. The energy absorbed seems to be dissipated on several simultaneous processes: recombination, diffusion and overcoming lattice potential barriers, de-excitation of excited molecules, heating the lattice,

Card 2/3

S/638/61/001/000/023/056
B104/B138

AUTHORS: Gurskiy, M. N., Sizykh, A. G., Starodubtsev, S. V.

TITLE: Variation in optical properties of γ-irradiated benzene

SOURCE: Tashkentskaya konferentsiya po mirnomy ispol'zovaniyu atomnoy energii. Tashkent, 1959. Trudy, v. 1. Tashkent, 1961, 168 - 171

TEXT: Benzene was purified by drying over sodium, fractionally distilled, and twice recrystallized. Its purity was checked from the optical refractive index (n_D^{20} = 1.5011 ± 0.0001), and then it was poured into glass ampouls and irradiated with a Co^{60} source. Initially colorless, it turns yellow at $5 \cdot 10^6$ r. With higher doses, insoluble yellowy-white precipitates are formed which can be removed by centrifuging. According to I. V. Vereshchinskiy ("Deystviye ioniziruyushchikh izlucheniy na neorganicheskiy i organicheskiy sistemy", AN SSSR, p. 234) and M. Burton (Journ. Am. Chem. Soc., 76, 10, 1954), separation of the benzene end leads to biradicals of the type $R(C_6H_6)_n^R$. Developed chains with conjugated bonds are characteristic of luminescent substances. Irradiated

Card 1/2

Variation in optical properties...

benzene luminesces bright green-blue. The luminescence was excited by an Hg lamp with УФС-4 (UFS-4) filter. The initial preparation showed no luminescence in the visible range. Intensity of luminescence increased with the dose increasing from 0.6 to $16 \cdot 10^6$ r. At the same time, maximum intensity shifts to the longwave range. The behavior of irradiated benzene is similar to that of diphenyl polyene. This suggests polymerization during irradiation. There are 2 figures and 7 references: 3 Soviet and 4 non-Soviet. The four references to English-language publications read as follows: Sten G., Weiss J., Journ. Chem. Soc., 3245-3351, 1945; Patrick W. N., Burton M., Journ. Am. Chem. Soc., 76, 10, 1954; Gordon S., Van Dyken A. R., Doumani T. F. Journ. Phys. Chem., 62, 1, 20, 1958; Gibson G. E., Blake N. and Kalm M. Journ. Chem. Phys., 21, 1000, 1953.

ASSOCIATION: Fiziko-tekhnicheskiy institut AN UzSSR (Physicotechnical Institute AS Uzbekskaya SSR)

S/638/61/001/000/024/056
B104/B138

AUTHORS: Vakhidov, Sh. A., Starodubtsev, S. V.

TITLE: Phosphorescence of crystalline quartz under gamma irradiation

SOURCE: Tashkentskaya konferentsiya po mirnomv ispol'zovaniyu atomnoy energii. Tashkent, 1959. Trudy, v. 1. Tashkent, 1961, 171 - 174

TEXT: On crystalline quartz from Pamir, Volynskaya oblast' (Volyn oblast') and from Ferganskaya dolina (Fergana valley) the authors studied the decay of phosphorescence excited by gamma rays, and the effect of electric treatment, heating, and ultraviolet light on phenomena connected with phosphorescence. They used a Co^{60} source with a radiation efficiency of 10^6 r/hr. The decay of phosphorescence does not follow an exponential law, and differs for quartzes of different origin. All gamma-irradiated quartz samples capable of coloration phosphoresced a few minutes after gamma irradiation. The more intensively blackened parts phosphoresced more strongly after gamma irradiation. Crystalline quartz plates were placed between carbon electrodes. Electric current (600 v,

Card 1/3

Phosphorescence of crystalline...

400 - 500°C) was passed along the principal optical axis for 10 hrs. After cooling to room temperature, the samples were irradiated for one hour. The phosphorescence of the crystal plates changed considerably. Irradiation of gamma-irradiated samples with ultraviolet light produced new phosphorescence in those crystals which had phosphoresced after gamma irradiation. In the electrically treated samples no phosphorescence was observed after irradiation with ultraviolet light. These results are explained according to V. L. Levshin (Izv. AN SSSR, ser. fiz. nauk, 2, 3, 1948, p. 277): The energy of absorbed radiation lifts electrons into the conductivity band. Electrons entering the conductivity band pass into their normal state due to emission of light or heat energy. They are partly trapped on shallow localization levels. They can be thermally excited on these levels, thus causing the second phosphorescence. In samples heated to 400°C, all electrons are localized on trapping levels. In the course of geological periods, electrons pass over to the valence band, making it impossible to produce phosphorescence on natural quartz by ultraviolet light. There are 4 figures and 9 references: 5 Soviet and 4 non-Soviet. The reference to the English-language publication reads as follows: Tutagami T. Proc. Phys. Soc. japan., 66, 20, 1938, p. 458.

Card 2/3

S/638/61/001/000/024/056
B104/B138

Phosphorescence of crystalline...

ASSOCIATION: Fiziko-tekhnicheskiy institut AN UzSSR (Physicotechnical Institute AS Uzbekskaya SSR)

Card 3/3

S/081/62/000/002/017/107
B149/B102

AUTHORS: Ablyayev, Sh. A., Yermatov, S. E., Starodubtsev, S. V.

TITLE: Alteration of the adsorbing properties of silica gel under the action of gamma radiation

PERIODICAL: Referativnyy zhurnal. Khimiya, no. 2, 1962, 95, abstract 2B682 (Tr. Tashkentsk. konferentsii po mirn. ispol'zovaniyu atomn. energii, 1959, v. I. Tashkent, AN UzSSR, 1961, 174 - 177)

TEXT: Alterations of adsorbing properties of silica gel (SG) (KCk(KSK) grade) on gamma irradiation with Co^{60} have been studied. The radiation dose was 150 - 350,000 r/hr, with a total dose of up to $2 \cdot 10^6$r. The irradiated gel adsorbs additional amounts (in micromoles/g) of the following gases: H_2 12, N_2 8, CO_2 18, NH_3 1, ethylene 0.5. On heating the irradiated gel the original properties are restored; at room temperature, properties resulting from irradiation are not altered over long periods of time. The effect of temperature on the radiation efficiency has been investigated. A hypothesis is advanced that on gamma irradiation of SG

Card 1/2

Alteration of the adsorbing...

S/081/62/000/002/017/107
B149/B102

there occur surface processes which favor an increase in adsorption properties, viz. (1) destruction of OH^- groups and formation of free valencies; (2) formation of electrically charged active centers; (3) breaking of bonds between free radicals. [Abstracter's note: Complete translation.]

Card 2/2

33118
S/638/61/001/000/045/056
B116/B138

54600

AUTHORS: Vasil'yeva, Ye. K., Starodubtsev, S. V.

TITLE: Effect of gamma rays on adsorption of complex cobalt compounds on silica gel

SOURCE: Tashkentskaya konferentsiya po mirnomy ispol'zovaniyu atomnoy energii. Tashkent, 1959. Trudy. v. 1. Tashkent, 1961, 277 - 279

TEXT: The authors studied the effect of gamma rays on the adsorption of cobalt ammoniates on silica gel, using tagged $CoCl_2$. To produce complex compounds, the $CoCl_2 \cdot 6H_2O$ solution was oxidized in the presence of ammonia. According to A. A. Grinberg (Vvedeniye v khimiyu kompleksnykh sovedineniy (Introduction to the chemistry of complex compounds), L.-M., Goskhimizdat 1951) it is mainly the complex compounds $[Co(NH_3)_6]Cl_3$ and $[Co(NH_3)_5Cl]Cl_2$ which are formed under such conditions. The water : ammonia ratio in the solution was 3 : 1. The silica gel was dried at 200°C, and, together with the solution, sealed into ampules (5 g of silica gel per 20 ml of solution). Half the samples were irradiated by a gamma source ($3 \cdot 10^3$ r/hr) with doses of

Card 1/3

Effect of gamma rays on ...

$20 - 80 \cdot 10^6$ r. The other half was used for control. Adsorption time was 120 hr. Activity was measured on a Б-2(B-2) apparatus. The adsorption of complex cobalt ions on silica gel was found to increase with concentration of the solution during irradiation. There was a tendency for the same state of equilibrium to be established in irradiated samples after irradiation as in those which had not been irradiated. The color change of silica gel during irradiation indicates that the ions here adsorbed during irradiation are of a different composition than under usual conditions. This is attributed to the establishment of new ion equilibrium during irradiation. The absorption spectra of the irradiated solutions shift toward the long wave side. It is suggested that the ions absorbed by the silica gel during irradiation contain no structurally bound water. The ion composition also changes when the silica gel is irradiated after adsorption. The stability of cobalt ammoniate solutions decreases during irradiation. Processes were observed, similar to those in a thermal treatment (formation of cobalt hydrates). When dry silica gel is irradiated without an adsorbent, the adsorption of complex compounds does not change. There are 3 figures and 6 references: 3 Soviet and 3 non-Soviet. The three references to English-language publications read as follows: Taylor, E. H., Wethington, I. A.,

33118
S/638/61/001/000/045/056
B116/B138

Effect of gamma rays on ...

J. Am. Chem. Soc., 76, 4, 971, 1954, Taylor, E. H., Kohn, H. W., J. Am. Chem. Soc., 79, 1, 252, 1957; Smith, G. W. Jacobson, H. W., J. Phys. Chem. 60, 7, 1956.

Card 3/3

S/638/61/001/000/046/056
B116/B138

AUTHORS: Keytlin, L. G., Starodubtsev, S. V.

TITLE: Variation of absorption bands in the spectrum of dyed polymethyl methacrylate under the action of gamma rays

SOURCE: Tashkentskaya konferentsiya po mirnomy ispol zovaniyu atomnoy energii. Tashkent, 1959. Trudy. v. 1. Tashkent, 1961, 279 - 281

TEXT: According to M. I. Day and Stein (Nature, 168, 644, 1951), the color change of dyed polymer during irradiation is due to fixation of the dyestuff of electrons (which are separated out during irradiation). This present paper endeavours to clarify this theory. The color change of thin polymethyl methacrylate plates was studied under the action of gamma rays using benzene-azo-alpha-naphthylamine as the dyestuff. To study the effect of admixtures, both plates without admixtures, and with dichloro ethane or benzene, were used. They were irradiated in vacuo at a dose rate of $3.5 \cdot 10^5$ r/hr. Under irradiation of the dyed polymethyl methacrylate

Card 1/2

S/638/61/001/000/048/056
B116/B138

AUTHORS: Starodubtsev, S. V., Azizov, S.

TITLE: Variation in linear dimensions of molten quartz during gamma irradiation

SOURCE: Tashkentskaya konferentsiya po mirnomy ispo- zovaniyu atomnoy energii. Tashkent, 1959. Trudy. v. 1. Tashkent, 1961, 283

TEXT: Molten quartz was exposed to Co^{60} gamma radiation. Measurements were made on a УИМ - 21 (UIM-21) microscope with about 10^{-4}% accuracy. The linear dimensions increased with the dose, reacting a maximum at $9 \cdot 10^7$ r. At $18 \cdot 10^7$ r, the dimensions decrease again, finally reaching their original values. The shrinkage observed at doses of $18 - 28 \cdot 10^7$ r corresponds to statements made by G. Mayer and J. Gigon (Journ. de Physique et le Radium, 18, 2, 109 - 114, 1957) and William Primak (see below). Only a slight

Card 1/2

S/638/61/001/000/048/056
B116/B138

Variation in linear dimensions...

change occurs on increasing the dose up to $36 \cdot 10^7$ r. There are 1 figure and 2 non-Soviet references. The reference to the English-language publication reads as follows: Primak William. Phys. Rev., 110, 6, 1240 - 1254, 1958.

ASSOCIATION: Fiziko-tekhnicheskiy institut AN UzSSR (Physicotechnical Institute AS Uzbekskaya SSR)

Card 2/2

22970
S/166/61/000/002/001/006
B112/B217

5.4500(B)

AUTHORS: Stasodubtsev, S. V., Member of the Academy of Sciences Uzbekskaya SSR, Ablyayev, Sh. A., Bakhramov, F., Keitlin, L. G., Yusova, E. N.

TITLE: Study of molecular conversions in a natural gas, produced by high-frequency electric discharges

PERIODICAL: Izvestiya Akademii nauk UzSSR. Seriya fiziko-matematicheskikh nauk, no. 2, 1961, 3-11

TEXT: The study of chemical conversions is to continue studies of different radiation effects on methane. A high-frequency device of the type ЛГЕ-3Б (LGE-ZB) was used for heating the dielectrics. The experimental arrangement is schematically represented in Fig. 1: A is a gas tank, B a rheometer, T a discharge tube, Л (L) a trap, P a reservoir, M a manometer, H a bulb, and D_1 and D_2 are catarrhometers. The reaction products were analyzed spectroscopically. The ИКС-14 (IKS-14) spectrograph used has a measuring range of 600-10000 cm^{-1} and prisms of LiF and

Card 1/5

Study of molecular conversions in a...

KCl.. The gas contained 98 % methane. The amount of energy absorbed on passage through the gas discharge tube was determined from the temperature difference $T_2 - T_1$ at the ends of the discharge tube.

$$E = 2.6\ 10^{19} M\ C_p (T_2 - T_1)\ ev,$$

where M is the mass of the gas, and C_p the specific heat at constant pressure. Fig. 2 shows the absorption spectrum of the gas. The dashed line (1) refers to a gas not subjected to electric discharge, whilst line (2) refers to a gas subjected to electric discharge. The effect of electric discharge on the gas resulted in the formation of liquid products which turned out to be derivatives of alkyl benzenes. The basic products are formed as follows:

$$CH_4^+ + CH_4 \rightarrow CH_5^* + CH_3$$

$$CH_5^* \rightarrow CH_3 + H_2$$

$$CH_4^+ + e \rightarrow CH_4^* \rightarrow CH_3 + H$$

$$CH_3^+ + CH_4 \rightarrow C_2H_5^+ + H_2$$

Card 2/5

Study of molecular conversions in a...

$$C_2H_5^+ + e \rightarrow CH_3 + CH_2$$

$$CH + CH \rightarrow C_2H_2$$

$$CH_2 + CH_2 \rightarrow C_2H_4$$

$$CH_3 + CH_3 \rightarrow C_2H_4 + H_2.$$

There are 3 figures and 26 references: 8 Soviet-bloc and 18 non-Soviet-bloc.

ASSOCIATION: Fiziko-tekhnicheskiy institut AN UzSSR (Institute of Physics and Technology, Academy of Sciences Uzbekskaya SSR)

SUBMITTED: January 7, 1961

Card 3/5

25105
S/166/61/000/003/004/004
B102/B202

9.2180

AUTHORS: Azizov, S., Starodubtsev, S. V., Academician of the AS Uzbekskaya SSR

TITLE: Effect of gamma radiation on the linear dimensions of specimens of molten quartz and seignette salt

PERIODICAL: Akademiya nauk Uzbekskoy SSR. Izvestiya. Seriya fiziko-matematicheskikh nauk, no. 3, 1961, 83 - 85

TEXT: Molten quartz and seignette salt are widely used in scientific studies; their radiation stability is still insufficiently investigated. In this connection the authors present data on the change of the linear dimensions of specimens of these substances caused by gamma irradiation. The samples were irradiated from a water-shielded Co^{60} source (2000-curies activity) with a dose rate of 10^6 r/hr. The linear dimensions of the molten quartz specimen were determined by means of a microscope of the type УИП-21 (UIM-21) warranting an accuracy of 10^{-3}%; First, an expansion of the specimen is observed. The maximum of relative elongation is

Card 1/3

Effect of gamma radiation...

attained at $90 \cdot 10^6$ r ($\Delta l/l = 6 \cdot 10^{-3}$). With a further increase of the dose, contraction occurs, the initial size being attained at $180 \cdot 10^6$ r; $\Delta l/l$, however, decreases further and, only in the range of $(260 - 360) \cdot 10^6$ r, size remains almost constant. The change of the linear dimensions of seignette salt were studied by a device of the type ИЗВ-1 (IZV-1) (accuracy 0.001 mm). Plates cut in two different directions straight and oblique were studied; in both cases, a linear increase of $\Delta l/l$ was observed beginning at doses of about $50 \cdot 10^6$ r. The two kinds of plates differed in the following: In the oblique ones, $\Delta l/l$ increased in the same way in direction a and in direction b at increasing dose; in the straight-cut ones, the relative extension in direction a was considerably less than in direction b. The inclination of the straight line in the latter case almost agree with that obtained for oblique cut. The anisotropy entails a decrease in mechanical strength leading to the decay of the specimen at $(150 - 160) \cdot 10^6$ r. The authors further studied the dependence of the melting point on gamma irradiation. The following was observed for seignette salt: from 0 to $40 \cdot 10^6$ r the melting point dropped from

Card 2/3

Effect of gamma radiation...

74 to 65°C, from (40 - 185)·10^6r it dropped from 65 to 53°C. The two sections of the curve run linearly. In seignette salt a seperation of gas can be observed already at relatively low doses. The corresponding studies were made in a vacuum chamber (10^{-3} mm Hg), the separation of gas was determined manometrically (error 0.05 mm Hg); recording was made by a device of the type ЭПВИ-14 (EPVI-14) and was checked by a device of the type ВТ-2 (VT-2). Irradiation was made with a dose rate of 10^3r/hr. In the range 0.6 - 6.6·10^5r, gas separation increased linearly with the dose. At (40 - 50)·10^6r, the curves showed a break. V. A. Yurin is mentioned. There are 4 figures and 5 references: 3 Soviet-bloc and 2 non-Soviet-bloc. The reference to the English-language publication reads as follows: Primak W. Phys. Rev., 1958, 110, 6, 1240 - 1254.

ASSOCIATION: Fiziko-tekhnicheskiy institut AN UzSSR (Institute of Physics and Technology of the AS Uzbekskaya SSR)

SUBMITTED: March 6, 1961

Card 3/3

27146
S/166/61/000/004/005/007
B112/B102

15.2610

AUTHORS: Domoryad, I. A., Starodubtsev, S. V., Member of the AS Uzbekskaya SSR, Khiznichenko, L. P.

TITLE: Precise method of measuring the changes of the elasticity characteristics of glass-like substances

PERIODICAL: Akademiya nauk Uzbekskoy SSR. Izvestiya. Seriya fiziko - matematicheskikh nauk, no. 4, 1961, 57 - 62

TEXT: The authors describe a method of determining the relative change $\Delta G/G$ of the shearing modulus G of glass-like substances as depending on the relative change $\Delta\nu/\nu$ of the frequency ν of torsional oscillations. This dependence is given by (2):

$$\Delta G/G = -3\Delta L/L + 2\Delta\nu/\nu \; ; \qquad (2)$$

L is the length of the thread-like specimen. The method described here is highly accurate for several reasons: on the one hand the authors use an experimental arrangement which permits a precise (automatic) measurement of the frequency ν (frictionless suspension of the thread, excitation of the torsional oscillations by a magnetic field), on the other, the

Card 1/2

Precise method of measuring the ...

authors demonstrate that the unevoidable deviation of the thread shape from the cylindrical shape does not change relation (2). Proof: if the radius R of the thread is approximately expressed by a relation $R = R_0 e^{\alpha |y|}$, the following relations hold:

$$\Delta G/G = \Delta L/L + \Delta S/S + 2\Delta\nu/\nu - \Delta R/R_0, \quad (13)$$

$$\Delta S/S = (1/\ln R/R_0 - 4R_0^4/(R^4 - R_0^4))(\Delta R_0/R_0 - \Delta R/R). \quad (16)$$

For $\Delta R_0/R_0 = \Delta R/R = \Delta L/L$, $\Delta S/S = 0$ and formula (13) goes over into formula (2) for a molten quartz thread in the experimental arrangement described here. The authors mention G. I. Kazakov. There are 6 figures.

ASSOCIATION: Akademiya nauk UzSSR (Academy of Sciences Uzbekskaya SSR)

SUBMITTED: April 25, 1961

Card 2/2

27147
S/166/61/000/004/006/007
B112/B102

5.4600
21.7100

AUTHORS: Starodubtsev, S. V., Member of the AS Uzbekskaya SSR, Azizov, S

TITLE: Change of microhardness and melting temperature of Rochelle salt due to gamma irradiation

PERIODICAL: Akademiya nauk Uzbekskoy SSR. Izvestiya. Seriya fiziko-matematicheskikh nauk, no. 4, 1961, 67 - 69

TEXT: Experiments showed that, upon gamma irradiation, the microhardness H of Rochelle salt changes considerably. A radiation dose of $4 \cdot 10^7$ - $5 \cdot 10^7$ r, causes a relative change $\Delta H/H$ in microhardness of -35%, a dose of $5 \cdot 10^7$ - $12 \cdot 10^7$ r of -60%. The authors also studied the change of the melting temperature of Rochelle salt in air under the action of a gamma irradiation. Figs. 2a and 2b show the temperature change as a function of the heating time, at a heating rate of 2°C/min. The three sections of the melting curves (steep - flat - steep) correspond to the phases of the salt (solid - melting - liquid). Fig. 3 shows the change of the temperature

Card 1/4

STARODUBTSEV, S.V., akademik; ABLYAYEV, Sh.A.; YERMATOV, S.Ye.; PULATOV, U.U.

Change in the adsorbing capacity of silica gel induced by high-frequency discharges. Izv. AN Uz. SSR. Ser. fiz.-mat. nauk no.6:77-78 '61. (MIRA 16:12)

1. Fiziko-tekhnicheskiy institut AN UzSSR. 2. Akademiya nauk UzSSR (for Starodubtsev).

STARODUBTSEV, S.V.; TIKHOMOLOVA, M.P.; AYZENSHTAT, Ye.L.; TASHMUKHAMEDOVA, K.

Effect of ionized radiation on carbohydrates. Part I: Formation of formaldehyde and 1,3-dihydroxyacetone in the course of gamma-raying of aqueous solutions of glucose, fructose, and maltose. Zhur.ob.khim. 31 no.9:3115-3118 S '61. (MIRA 14:9)
(Saccharides) (Gamma rays)

5.2400
5.4600

25716 S/020/61/139/003/015/025
B103/B226

AUTHORS: Starodubtsev, S. V., Academician AS Uzbekskaya SSR, Domoryad, I. A., and Khiznichenko, L. P.

TITLE: Change of the mechanical characteristics of amorphous selenium under the action of gamma rays

PERIODICAL: Akademiya nauk SSSR. Doklady, v. 139, no. 3, 1961, 594-595

TEXT: The present paper gives the results of a study of the effect of gamma rays upon the internal friction Q^{-1} and the shear modulus G of amorphous selenium, obtained from the logarithmic decrement and the frequency of torsional vibrations, respectively (see the authors' paper Ref. 1: Izv. AN UzSSR, ser. fiz., No. 4 (1961)). The data on the mechanical properties of selenium, especially the elastic properties of irradiated selenium, are not contained in the literature. Measurements were conducted with selenium threads drawn out of the melt. The fused-off ends of the specimens had a characteristic shape and served for holding the specimen. Thus, the point where the clamps were attached was prevented from friction. The length of the thread was 30 mm, its diameter

Card 1/4

Change of the mechanical characteristics...

20 - 100 μ. The longitudinal stress acting on specimens having different diameters was between 300 and 1500 g/mm^2. This is much less than the tensile strength of selenium threads (11 ± 1.5 kg/mm^2) found by the authors in a special test. The deformation of the specimens investigated did not exceed 10^{-5}. The specimens were irradiated in a Co^{60} apparatus with a dose of $700 \cdot 10^3$ r/hr. Fig. 1 shows the dependence of the relative change of the shear modulus G and of the internal friction Q^{-1} on the duration of irradiation. Therefrom, it can be seen that G of glass-like selenium increases monotonically with the dose up to saturation. In this case, the maximum change of the relative value $\Delta G/G$ amounts to 10 % at a dose of about $20 \cdot 10^6$ r, whereas Q^{-1} is changed more strongly, i.e., it decreases by 40 %. In order to clarify the radiative disturbances in selenium, the irradiated specimens were heated and kept at the given temperature for a certain time interval. Measurements were conducted at 17°C. The authors established that in the course of 10 days no notable annealing occurred. The properties of selenium are partially restored by subjecting the specimen to a temperature of 25°C for 15 min (Fig. 2); later on, however, the crystallization process probably goes on increasing. A further heating leads to a further increase of G [Abstracter's note: Text at the end of

p. 594 interrupted.] The radiative changes of G and Q^{-1} observed in amorphous selenium are apparently due to the peculiarities of its structure. At present, glass-like selenium is assumed to have a ring structure Se_8. While drawing threads the authors, however, established advantageous conditions for a predominating orientation of —Se—Se— chains. Due to the varying speed of drawing and irregular cooling of the specimens at individual spots, a rupture of the chains, deformation of the rings, and different kinds of uncontrollable distortions occurred, whereby a non-equilibrium state in the structure of the thread was caused. As is shown by the experimental results, G is increased by gamma irradiation, while Q^{-1} is decreased. This corresponds, as it were, to the transition to a more equilibrated, crystalline state of the substance. Accordingly, the authors assume that the penetrating radiation compensates all possible distortions in glass-like selenium and, thus, arranges its structure. There are 2 figures and 2 Soviet-bloc references.

SUBMITED: April 21, 1961

Card 3/4

STARODUBTSEV, Sergey Yakovlevich; LITVINOV, N.D., prof., red.;
[Short course on chemistry] Kratkii kurs khimii. Moskva, Mosk. energ. in-t, No.4. 1962. 108 p. (MIRA 16:9)
(Chemistry)

PHASE I BOOK EXPLOITATION SOV/6309

Starodubtsev, S. V., and A. M. Romanov

Prokhozhdeniye zaryazhennykh chastits cherez veshchestvo (Penetration of Charged Particles Through Matter) Tashkent, Izd-vo AN UzSSR, 1962. 226 p. 2500 copies printed. Added t. p. in Uzbek.

Sponsoring Agency: Akademiya nauk Uzbekskoy SSR. Fiziko-tekhnicheskiy institut.

Ed.: I. G. Gaysinskaya; Tech. Ed.: Kh. U. Karabayeva.

PURPOSE: The book is intended for staff members of research institutes, teachers at higher educational institutions, and students of advanced courses in physics departments.

COVERAGE: Theoretical fundamentals of the interaction of charged particles with matter are presented, and the results of experimental investigations on the penetration of charged particles and electrons through matter are examined. The basic emphasis is on problems concerning the loss of energy and the ionization produced by charged particles. No personalities are mentioned. There are 520 references, most of them to books and journals in English.

STARODUBTSEV, S.V., akademik, otv. red.; SOKOLOVA, A.A., red.; BAKLITSKAYA, A.V., red.; GOR'KOVAYA, Z.P., tekhn. red.

[Problems in modern physics and mathematics] Voprosy sovremennoi fiziki i matematiki. Tashkent, Izd-vo Akad. nauk Uzbekskoi SSR, 1962. 275 p. (MIRA 15:7)

1. Akademiya nauk Uzbekskoy SSR, Tashkent. Otdeleniye fiziko-matematicheskikh nauk. 2. Akademiya nauk Uzbekskoy SSR (for Starodubtsev).

(Physics) (Mathematics)

STARODUBTSEV, S. V.

90

SOV/6176

PHASE I BOOK EXPLOITATION

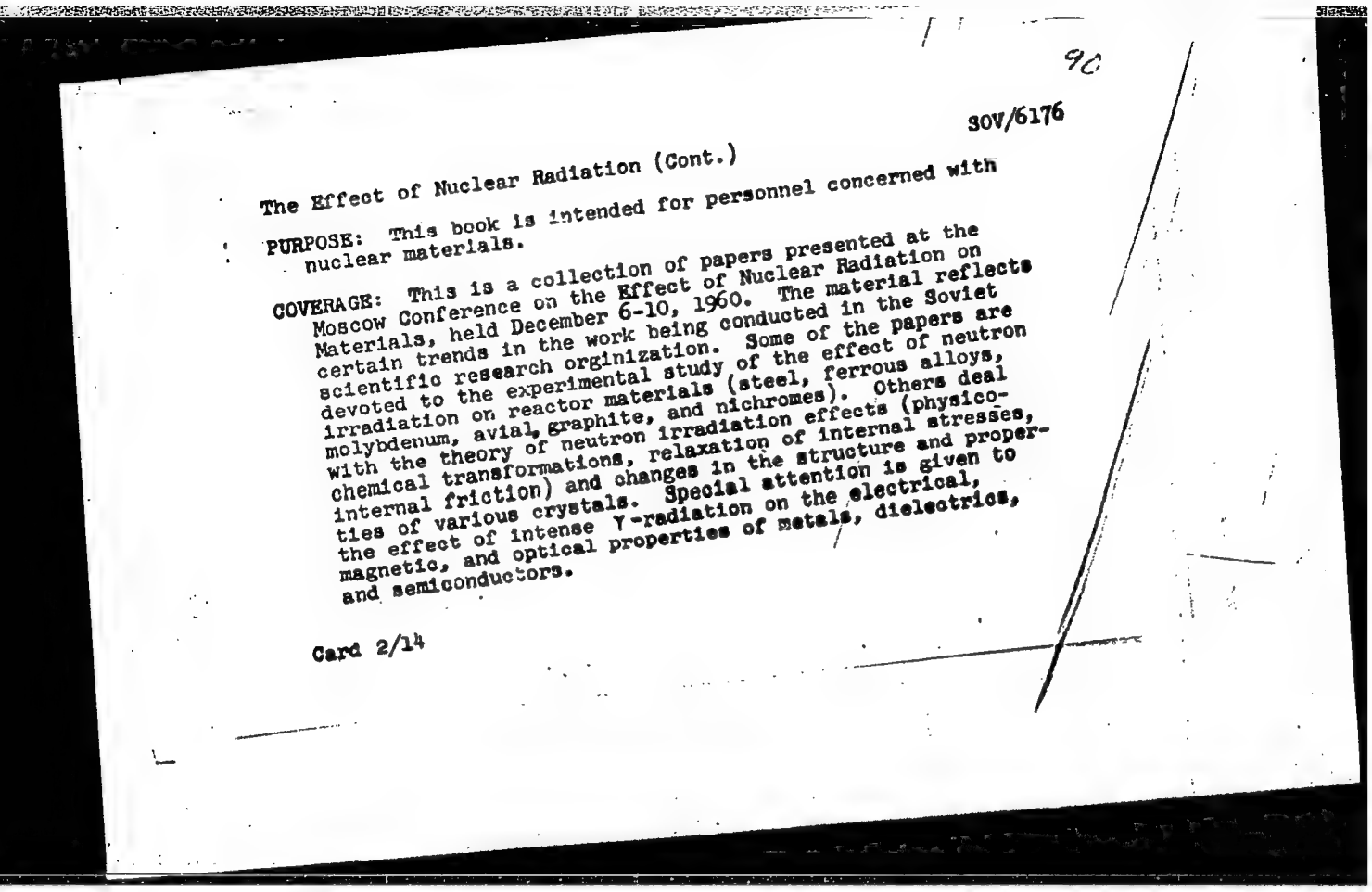
Konobeyevskiy, S. T., Corresponding Member, Academy of Sciences USSR, Resp. Ed.

Deystviye vadernykh izlucheniy na materialy (The Effect of Nuclear Radiation on Materials). Moscow, Izd-vo AN SSSR, 1962. 383 p. Errata slip inserted. 4000 copies printed.

Sponsoring Agency: Akademiya nauk SSSR. Otdeleniye tekhnicheskikh nauk; Otdeleniye fiziko-matematicheskikh nauk.

Resp. Ed.: S. T. Konobeyevskiy; Deputy Resp. Ed.: S. A. Adasinskiy; Editorial Board: P. L. Gruzin, G. V. Kurdyumov, B. M. Levitskiy, V. S. Lyashenko (Deceased), Yu. A. Martynyuk, Yu. I. Pokrovskiy, and N. F. Pravdyuk; Ed. of Publishing House: M. G. Makarenko; Tech. Eds: T. V. Polyakova and I. N. Dorokhina.

Card 1/14



90

SOV/6176

The Effect of Nuclear Radiation (Cont.)

PURPOSE: This book is intended for personnel concerned with nuclear materials.

COVERAGE: This is a collection of papers presented at the Moscow Conference on the Effect of Nuclear Radiation on Materials, held December 6-10, 1960. The material reflects certain trends in the work being conducted in the Soviet scientific research orginization. Some of the papers are devoted to the experimental study of the effect of neutron irradiation on reactor materials (steel, ferrous alloys, molybdenum, avial, graphite, and nichromes). Others deal with the theory of neutron irradiation effects (physico-chemical transformations, relaxation of internal stresses, internal friction) and changes in the structure and properties of various crystals. Special attention is given to the effect of intense Y-radiation on the electrical, magnetic, and optical properties of metals, dielectrics, and semiconductors.

Card 2/14

The Effect of Nuclear Radiation (Cont.)

L 13060-63 BDS/EWT(1)/EWG(k)/EEC(b)-2 AFFTC/ASD/ESD-3 Pz-4
ACCESSION NR: AT3003005 AT/IJP(C) S/2927/62/000/000/0214/0217

AUTHOR: Kiv, A. Ye.; Niyazova, O. R.; Starodubtsev, S. V.

TITLE: Sonde characteristics of semiconductors under continuous excitation conditions [Report of the All-Union Conference on Semiconductor Devices held in Tashkent from 2 to 7 October 1961]

SOURCE: Elektronno-dy*rochny*ye perekhody* v poluprovodnikakh. Tashkent, Izd-vo AN UzSSR, 1962, 214-217

TOPIC TAGS: semiconductor sonde characteristic

ABSTRACT: A theoretical interpretation is offered for a photo-conductivity characteristic of a semiconductor illuminated by a spot light (sonde). Differential equations describing the steady-state distribution of carriers are set up, a condition expressing additional carriers is introduced, and the set is solved for i(x sub 0), the sonde characteristic. Relative positon of the maximum of the sonde characteristic is determined. Orig. art. has: 1 figure and 14 formulas.

ASSOCIATION: Tashkent St. Un.

Card 1/2

L 2440-66 EWP(e)/EPA(s)-2/EWT(m)/EPF(c)/EWP(i)/EPF(n)-2/EPA(w)-2/EWP(t)/
EWP(b)/EWA(h)/EWA(l) IJP(c) JD/GG/GS/WH

ACCESSION NR: AT5023817 UR/0000/62/000/000/0347/0354

AUTHOR: Starodubtsev, S. V.; Azizov, S. A.; Domoryad, I. A.; Peshikov, Ye. V.; Khiznichenko, I. P.

TITLE: Change in the mechanical characteristics of certain solids exposed to gamma radiation

SOURCE: Soveshchaniye po probleme Deystviye yadernykh izlucheniy na materialy. Moscow, 1960. (Deystviye yadernykh izlucheniy na materialy (The effect of nuclear radiation on materials); doklady soveshchaniya. Moscow, Izd-vo AN SSSR, 1962, 347-354

TOPIC TAGS: gamma irradiation, quartz, shear modulus, irradiation effect, dielectric property, solid mechanical property

ABSTRACT: The effect of γ radiation on certain mechanical and dielectric properties of fused quartz fibers, Rochelle salt crystals, and ceramic barium titanate is studied. A 1.25 MEV Co^{60} γ source was employed at a dose rate of 10^6 r/hr. The shear modulus of fused quartz increases with the dose, and at 1.5×10^9 r, the change $\Delta G/G$ is 0.22% (± 0.02%). Gamma irradiation also changes the linear dimensions of fused quartz. These changes in elasticity

Card 1/2

L 2440-66

ACCESSION NR: AT5023817

and size may be satisfactorily explained by assuming a partial ordering (crystallization) of the lattice under the influence of γ rays. The observed effects of intense γ irradiation on the linear dimensions and "melting" point of Rochelle salt appear to be due to the destruction of the sample. The considerable effect of γ irradiation on the dielectric and elastic properties of $BaTiO_3$ ceramics are qualitatively similar to the aging process. The presence of healing at room temperature indicates that at least some of the defect centers (or new states of the domain walls) are unstable. Orig. art. has: 8 figures.

ASSOCIATION: none

SUBMITTED: 18Aug62 ENCL: 00 SUB CODE: NP, SS

NO REF SOV: 004 OTHER: 008

Silicon 27

Card 2/2 hd

L 2439-66 EWP(e)/EWT(m)/ EPF(c)/EWP(i)/ETC/EPF(n)-2/EWP(t)/EWP(b)/EWG(m)
IJP(c) RDW/JD/GG/GS

ACCESSION NR: AT5023818 UR/0000/62/000/000/0355/0361 68 B+1

AUTHOR: Starodubtsev, S. V.; Usmanova, M. M.; Mikhaelyan, V. M. 47

TITLE: Change in certain electric properties of boron and amorphous selenium under the influence of γ radiation 19

SOURCE: Soveshchaniye po probleme Deystviye yadernykh izluchenly na materialy. Moscow, 1960. Deystviye yadernykh izluchenly na materialy (The effect of nuclear radiation on materials); doklady soveshchaniya. Moscow, Izd-vo AN SSSR, 1962, 355-361

TOPIC TAGS: boron, selenium, gamma irradiation, irradiation effect, electric conductivity, dielectric loss, internal friction

ABSTRACT: The effect of powerful γ radiation on the electrical conductivity of polycrystalline boron and amorphous (vitreous) selenium and on the stability of this amorphous modification is investigated. A technique was developed for preparing polycrystalline boron samples from its amorphous modification by high-temperature vacuum sintering and refining. A marked increase in the electrical conductivity of polycrystalline boron exposed to the γ rays is noted. Irreversible and pronounced changes in such structurally sensitive parameters as the electrical conductivity, dielectric loss, and internal friction are observed in vitreous

Card 1/2

L 2439-66

ACCESSION NR: AT5023818

selenium following irradiation, probably as a result of the rearrangement of the amorphous modification into a crystalline one. The experimental findings indicate that γ irradiation does not merely induce the excitation of charge carriers and the filling of traps, but also the formation of new defect states responsible for changes in the conductivity. Orig. art. has: 6 figures and 1 table.

ASSOCIATION: none

SUBMITTED: 18Aug62 ENCL: 00 SUB CODE: NP, IC

NO REF SOV: 002 OTHER: 005

Card 2/2 hd

L 2441-66 EWT(1)/EWP(e)/EWT(m)/EWP(i)/EWP(t)/EWP(b)/EWA(h)/EWA(l)
IJP(c) JD/GS/WH

ACCESSION NR: AT5023819 UR/0000/62/000/000/0362/0365 43 42 B+1

AUTHOR: Starodubtsev, S. V.; Vakhidov, Sh. A. 44,55

TITLE: Luminescence of crystalline quartz exposed to ultraviolet and gamma rays

SOURCE: Soveshchaniye po probleme Deystviye yadernykh izlucheniy na materialy. Moscow, 1960. Deystviya yadernykh izlucheniy na materialy (The effect of nuclear radiation on materials); doklady soveshchaniya. Moscow, Izd-vo AN SSSR, 1962, 362-365

TOPIC TAGS: thermoluminescence, quartz crystal, gamma irradiation, UV irradiation, color center, electron transition, electron energy level

ABSTRACT: In order to investigate the nature of the centers responsible for the color of quartz crystals and for the appearance of various thermoluminescence peaks, quartz wafers measuring 1 x 1 x 0.1 cm were exposed to Co^{60} gamma radiation (600 r/sec) at liquid nitrogen and room temperature; then, after being removed from the radiation field, cooled in liquid nitrogen, and left standing for 20-30 hr, they were illuminated with UV light. On the basis of the results obtained and findings of other authors, it is postulated that the thermoluminescence processes occurring in crystalline quartz subjected to ionizing radiation are related to electron transitions between various local states. An explanation

Card 1/2

L 2441-66
ACCESSION NR: AT5023819

of the thermoluminescence process in terms of these transitions is offered.
Orig. art. has: 3 figures.

ASSOCIATION: none

SUBMITTED: 18Aug62 ENCL: 00 SUB CODE: SS, OP

NO REF SOV: 000 OTHER: 007

Silicon 27

Card 2/2 hd

L 2442-66 EWT(m)/EPF(c)/EPF(n)-2/EWP(t)/EWP(b) LJP(c) JD/GG/GS

ACCESSION NR: AT5023820 UR/0000/62/000/000/0366/0369

43
B

AUTHOR: Starodubtsev, S. V.; Ablyayev, Sh. A.; Yermatov, S. Ye.

TITLE: Effect of gamma fluxes on the adsorptive properties of vacuum materials

SOURCE: Soveshchaniye po probleme Deystviye yadernykh izluchenly na materialy. Moscow, 1960. Deystviye yadernykh izluchenly na materialy (The effect of nuclear radiation on materials); doklady soveshchaniya. Moscow, Izd-vo AN SSSR, 1962, 366-369

TOPIC TAGS: silica gel, aluminum silicate, gamma irradiation, irradiation effect, gas adsorption

ABSTRACT: The article continues the study of γ-ray-induced changes in the adsorptive properties of KSK and ASM silica gel and plant-produced aluminosilicates. Oxygen and hydrogen were used as the adsorbed gases, and the radiation dose rate was (150-350) 10^3 r/hr. All the results showed an increase in adsorptive capacity that was much more pronounced in silica gels than in aluminosilicates. The temperature dependence of this radiation effect was investigated between +100 and -130C, and the adsorptive capacity was found to increase with decreasing temperature (this increase was much greater than that of nonirradiated samples). The adsorption isotherms were found to be linear both at room temperature and at the

Card 1/2

L 2442-66
ACCESSION NR: AT5023820

liquid nitrogen temperature. Curves of the time dependence of the adsorption showed that equilibrium pressure is established after a certain time interval, i.e., the adsorption is not instantaneous. The data indicate that to a first approximation the additional active adsorption centers produced by the γ rays obey the same laws as ordinary centers on silica gel. The property of silica gels to thus increase their adsorptive capacity was utilized for the creation of a greater vacuum in Dewar flasks and thermos bottles. Tests showed that the rate of cooling of hot water in pre-irradiated thermos bottles containing a silica gel compartment was slower, and after 20 hr. the temperature of the water was 5 to 8° higher than in nonirradiated bottles. Orig. art. has: 7 figures.

ASSOCIATION: none

SUBMITTED: 18Aug62 ENCL: 00 SUB CODE: NP, MT

NO REF SOV: 001 OTHER: 000

BVK

Card 2/2

A329

S/844/62/000/000/118/129
D207/D307

AUTHORS: Starodubtsev, S. V. and Blaunshteyn, I. M.

TITLE: Changes in the magnetic properties of inorganic solids in a field of intense γ radiation

SOURCE: Trudy II Vsesoyuznogo soveshchaniya po radiatsionnoy khimii. Ed. by L. S. Polak. Moscow, Izd-vo AN SSSR, 1962, 683-687

TEXT: Ionic and ionic-covalent crystals as well as semiconducting compounds and elements were subjected to Co^{60} γ ray irradiation (0.33×10^6 r/hour) and changes in their magnetic susceptibilities, (χ), were measured. The change in χ was taken to be proportional to the change in the force acting on a sample in a nonuniform magnetic field of 10^4 oe. The force was measured with analytic balances BA-200 (VA-200) to within 0.02 mg. The susceptibilities of BaCl, KI, NaCl and $KMnO_4$ were not affected by irradiation. The diamagnetic susceptibilities of $NaNO_3$ and KNO_3 were reduced and the compounds

Card 1/2

Changes in the ...

were partly radiolyzed by γ rays. Large changes of χ were observed in antiferromagnetics: in α-Fe_2O_3, Cr_2O_3, $FeCl_2$, $FeCl_3$, and FeS the paramagnetic susceptibility increased to the stray ferromagnetism of radiation defects, while in Co_2O_3 and $CoCl_3$ the paramagnetic susceptibility decreased because of compensation of the sublattice magnetization by radiation-excited O and Cl atoms. In CuCl the diamagnetic suscpetibility decreased in air (but not in vacuum) owing to the formation of paramagnetic centers in the form of $CuCl_2$, or CuO and CuOCl. The diamagnetic moment of CaO, MgO, BaO and ZnO increased after irradiation owing to impurity oxygen formed by radiolysis, which strongly affected the electronic properties of these compounds. Semiconducting compounds and elements (CdSe, Se) exhibited a rise of their diamagnetism after irradiation. The results reported are of qualitative nature but they indicate that the change in the magnetic susceptibility after irradiation can be used to obtain additional information on the nature of radiation defects. There are 7 figures and 1 table.

ASSOCIATION: Fiziko-tekhnicheskiy institut AN UzbSSR (Physico-Technical Institute, AS UzSSR)

Card 2/2

S/844/62/000/000/119/129
D207/D307

AUTHORS: Starodubtsev, S. V., Ablyayev, Sh. A., Vasil'yeva, Ye. K. and Yermatov, S. Ye.

TITLE: Effect of γ radiation on adsorption properties of silica gels

SOURCE: Trudy II Vsesoyuznogo soveshchaniy po radiatsionnoy khimii. Ed. by L. S. Polak. Moscow, Izd-vo AN SSSR, 1962, 689-692

TEXT: Factory-made silica gel of КСК (KSK) grade was heat-treated in evacuated ampoules and then subjected to γ rays at dose rates up to 340,000 r/hour. Adsorption was then investigated by admitting a gas or vapor to the ampoules held at temperatures from +20°C to liquid-nitrogen temperature. On cooling, the adsorption ability of silica gel increased even without irradiation, but γ rays intensified this increase. The amount of oxygen adsorbed rose linearly with pressure of the admitted gas or vapor in unirradiated and irradiated silica gel, indicating the same nature of adsorption cen-

Card 1/2

Effects of γ radiation ...

ters in both cases. The silica gel surface became saturated with adsorption centers at doses of 2 - 3 x 10^6 r. Gamma irradiation raised the amount of heptane vapor that could be adsorbed on silica gel (this effect was smaller than for the majority of gases) but made no difference to the adsorption of benzene vapor. Irradiation of aqueous solutions of ammines of the $[Co(NH_3)_6]Cl_3$ type in direct contact with silica gel raised the amount of liquid adsorbed because of radiation-induced chemical reactions in the solutions rather than due to changes on the silica gel surface. Gamma-irradiation raised also the amounts of oxygen and hydrogen that could be adsorbed by aluminosilica gel. A practical application of these observations consisted of placing γ activated silica gel between the walls of a thermos flask. This improved the vacuum between these walls, by adsorbing more gas than unirradiated silica gel, and thus reduced heat transmsiion through the walls. Such thermos flasks were prepared at the Ashkhabadskiy stekol'nyy kombinat im. V. I. Lenina (Ashkhabad Glass Combine im. V. I. Lenin). There are 7 figures.

ASSOCIATION: Fiziko-tekhnicheskiy institut AN UzbSSR (Physico-Technical Institute AS UzSSR)

S/844/62/000/000/129/129
D204/D307

AUTHORS: Starodubtsev, S. V., Gurskiy, M. N. and Sizykh, A. G.

TITLE: Optical-spectroscopic methods for the study of the irradiation of benzene

SOURCE: Trudy II Vsesoyuznogo soveshchaniya po radiatsionnoy khimii. Ed. by L. S. Polak. Moscow, Izd-vo AN SSSR, 1962, 747-750

TEXT: In continuation of earlier work on the radiolysis of benzene (DAN SSSR, 129, 307, (1959)), molecular optics and spectroscopic methods were used to determine the initial stages of the formation of a polymeric product resulting from the irradiation of benzene. The scattered light method was used, measuring the variations in the degree of depolarization (Δ) and in the intensities of the polarized components of scattered light as the dose was increased (γ irradiation, 76 - 543 r/sec). This method proved the most sensitive. For unevacuated samples Δ decreased linearly with increasing dose, from ~0.42 at 0.075×10^6 r to 0.25 at ~0.95×10^6 r;

Card 1/3

Optical-spectroscopic methods ...

the isotropic component of the scattered light ($I_{isotropic}$) increased, while $I_{anisotropic}$ remained essentially constant. These effects were amplified by freezing the samples immediately after irradiation. The decrease of Δ was less pronounced in degassed samples, showing that a lesser amount of the polymer is precipitated under these conditions. Irradiation of unevacuated samples with ultraviolet (5 1/2 hours) gave results analogous to those of γ irradiation. With higher amounts of the radiolysis products (doses $\sim 10^7$ r), the reactions may be followed by spectroscopic methods. Luminescence spectra may be used to detect an increase in the molecular weight, i.e. the formation of the polymeric product when benzene is irradiated. With low dosages of γ rays (3×10^5 r) and under UV irradiation over 5 1/2 hours (unevacuated samples only), clearly defined peaks appeared at ~5625 Å. In the case of γ irradiation, the maximum for evacuated samples was less intense. There are 3 figures and 2 tables.

Card 2/3

ACCESSION NR: AR4015667 S/0081/63/000/021/0489/0489

SOURCE: RZh. Khimiya, Abs. 21S108

AUTHOR: Arifdzhanov, A.; Starodubtsev, S. V.; Sultanov, A. S.

TITLE: Polymerization of acrylonitrile in solutions under the influence of gamma rays

CITED SOURCE: Sb. Fizika i khimiya prirodn. i sintetich. polimerov. Tashkent, AN UzSSR, vy*p. 1, 1962, 143-148

TOPIC TAGS: acrylonitrile, acrylonitrile polymerization, dimethyl formamide, sodium rhodanide, potassium rhodanide, polymer transition depth, finished strand solution, gamma radiation, radiation polymerization

ABSTRACT: The polymerization of acrylonitrile was studied in aqueous solutions of K, Na and NH_4 rhodanides, as well as in dimethyl formamide, in order to obtain finished strand solutions. Total transformation can be attained during polymerization in such solutions (at doses of 4000 rad), but the solutions cannot be used directly for spinning in view of their low specific viscosity. The value of $[\eta]$ does not vary with the degree of transformation. Polymerization in mixtures of dimethyl formamide and water (up to 25%) does not lead to increased values of characteristic

Card 1/2

VISCOSITY (CH J-030), P. KHOMIKOVSKIY.

S/166/62/000/006/006/016
B101/B186

AUTHORS: Starodubtsev, S. V., Ablyayev, Sh. A., Bakhramov, F., Ziyatdinov, Sh., Keytlin, L. G.

TITLE: Study of molecular conversions in natural gas under the action of electrodeless high-frequency discharges. III. Effect of the wattage of high-frequency discharges and gas pressure in the discharge tube on electrocracking

PERIODICAL: Akademiya nauk Uzbekskoy SSR. Izvestiya. Seriya fiziko-matematicheskikh nauk, no. 6, 1962, 53 - 60

TEXT: To clarify the basic mechanism of electrocracking, methane was cracked at various wattages (20 - 180 w), pressures (20 - 60 mm Hg), and contact times τ (0.01 - 2.4 sec); total cracking and the yields of ethane, ethylene, acetylene, propane, propylene, butylenes, and hydrogen was determined. Total cracking increased with wattage: the rise was gradual up to ~30 w, τ = 0.05 sec, steep between 30 and 100 w, and then gradual again. The steep section of the curve corresponds to the range where a chain mechanism operates. The threshold limit of the wattage at which the steep rise sets in decreases with increasing τ. The yields of ethane and

Card 1/3

ethylene fall with increasing wattage for τ = const. No C_2H_6 or C_2H_4 is formed at 140 - 150 w. The yield of acetylene increases with the wattage, passes a maximum at a certain wattage depending on τ, and then falls steadily. The maximum C_2H_2 yield is 11% at 50 w and τ = 0.8 sec, and 22.5% at 100 w and τ = 0.3 sec. Diacetylene forms at low wattages. More and more liquids are formed with increasing wattage, and diacetylene disappears due to formation of cyclohydrocarbons. For propane and propylene, there is also a maximum at 50 w and τ = 0.4 sec which vanishes at high wattages, probably being shifted toward very short τ. The yield maxima for C_3H_8 and C_3H_6 lie in the range where intense decomposition of C_2H_6 and C_2H_4 begins. Butylenes form only at low wattages, they are no longer detectable at 140 w. The hydrogen yield, however, rises continuously with w and τ. The specific energy consumption for a tube 2.5 cm in diameter and for τ = 0.3 sec was 70 w·hr per mole of cracked CH_4, and 280 w·hr per mole of resulting C_2H_2. The corresponding values for a diameter of 9.1 cm and τ = 0.3 sec were 65 and 260 w·hr. Increasing pressure has the same effect as increasing wattage on the cracking and the yield of decomposition products. Experiments with tubes of different diameters d showed that total cracking depends linearly

on the surface/volume ratio. Total cracking in two tubes of different d in proportional to d_2^2/d_1^2, which may be explained by the termination on the walls of the tubes. Furthermore, the yield of the individual products depends on d, and this requires further investigation. There are 7 figures and 1 table.

ASSOCIATION: Fiziko-tekhnicheskiy institut AN UzSSR (Physicotechnical Institute AS UzSSR)

SUBMITTED: July 13, 1962

Card 3/3

S/166/62/000/006/007/016
B104/B186

AUTHORS: Starodubtsev, S. V., Ablyayev, Sh. A., Alimova, L. Ya., Sokolova, Yu. B.

TITLE: An investigation of the molecular transformations in natural gas occurring under the action of electrodeless high-frequency discharges. IV. Study of the kinetics of transformation and destruction of some free radicals

PERIODICAL: Akademiya nauk Uzbekskoy SSR. Izvestiya. Seriya fiziko-matematicheskikh nauk, no. 6, 1962, 61-65

TEXT: An investigation with the ИСП-51 (ISP-51) spectrograph is made to elucidate the formation and destruction of the radicals H, C_2, and CH which are formed in natural gas, containing 96% methane, at 0.2 - 30 mm Hg under electrodeless high-frequency discharges. Results: The CH radical is formed principally from the methane molecule by electron bombardment. The acetylene molecule is formed from this radical. The C_2 radical results from the HC_2 radical by splitting off the H atom. The acetylene

Card 1/2

An investigation of the molecular ... S/166/62/000/006/007/016
B104/B186

molecule is formed also from the C_2 radical. There are 3 figures.

ASSOCIATION: Fiziko-tekhnicheskiy institut AN UzSSR
(Physicotechnical Institute AS UzSSR)

SUBMITTED: July 13, 1962

Card 2/2

ARIFDZHANOV, A.; STAROMYATSEV, S.V.; SULTANOV, A.S.

Polymerization of acrylonitrile in solutions under the effect of γ-rays. Khim. i fiz.-khim. prirod. i sint. polim. no.1: 143-148 '62 (MIRA 18:1)

33362
S/181/62/004/001/038/052
B104/B112

24,7800 (1035, 1043, 1153)

AUTHORS: Peshikov, Ye. V., and Starodubtsev, S. V.

TITLE: Changes in the properties of irradiated Rochelle salt single crystals (in weak electric fields)

PERIODICAL: Fizika tverdogo tela, v. 4, no. 1, 1962, 239 - 245

TEXT: Rochelle salt single crystals were exposed to Co^{60} radiation of $0.5 \cdot 10^6$ r/hr at 10 - 20°C in a waterproof apparatus. Their dielectric properties were determined with foil electrodes on X-cut plates 0.4-0.9 mm thick and 0.3-1.0 cm^2 large. Measurements included the temperature dependence of the capacity and loss angle of crystals irradiated with different doses, the variation of the Curie point as a function of the doses, the effect of annealing on the tanδ of the irradiated crystals, the effect of irradiation on their nonlinearity, their resonant frequency, and their Q-factor. Their specific properties were substantially changed by irradiation. The interpretation of the changes is very difficult due to the complex relationship between the measured characteristics, and due to the

Card 1/2

S/166/62/000/002/003/008
B112/B104

26 242-1

AUTHORS: Starodubtsev, S. V., Niyazova, O. R., Matyskin, V. I., Kiv, A. Ye.

TITLE: Alpha-counter characteristics of cadmium sulfide single crystals

PERIODICAL: Akademiya nauk Uzbekskoy SSR. Izvestiya. Seriya fiziko-matematicheskikh nauk, no. 2, 1962, 42-45

TEXT: An alpha probe was used to examine the amplitude of alpha pulses in CdS crystals as a function of the applied voltage. The X-ray conductivity and the counting rate were determined by means of probes. The maxima of the X-ray conductivity and of the counting rate have been found to coincide. It is concluded that the distribution of charge carriers in the crystal during pulse formation resembles that which occurs under local X-radiation in the steady state. An analysis of counter characteristics shows that the pulse maxima for n-type and p-type semiconductors are near the cathode and the anode, respectively. There are 4 figures.

ASSOCIATION: AN UzSSR (AS UzSSR)

Card 1/2

Alpha-counter characteristics of ...

S/166/62/000/002/003/008
B112/B104

SUBMITTED: September 20, 1961

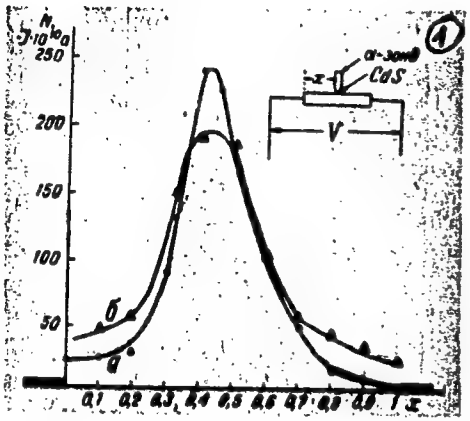


Fig. 3. Characteristics.
Legend: (a) counting rate;
(б) X-ray conductivity; (1) α probe.

Card 2/2

42094

S/166/62/000/005/003/008
B108/B186

15,2640

AUTHORS: Peshikov, Ye. V., Starodubtsev, S. V.

TITLE: Gamma-induced aging of $BaTiO_3$ ceramics

PERIODICAL: Akademiya nauk Uzbekskoy SSR. Izvestiya. Seriya fiziko-matematicheskikh nauk, no. 5, 1962, 37-39

TEXT: The effect of gamma irradiation upon the electromechanical and dielectric properties of $BaTiO_3$ at $20\pm0.2^{\circ}C$ in weak electrical fields was studied. A resonance method (E. A. Ceber, U. F. Koerner, Proc. I. R. E., 46, no. 10, 1731, 1958) was used to measure the resonant frequency $f_r = \frac{a}{D}\sqrt{E/\rho(1-\sigma^2)}$ and the resistance equivalent to the electromechanical losses, R_1. The latter was determined from its relationship to the Q-factor; $Q \simeq \frac{\delta f_r}{\pi R_1 C f_r^2}$. D is the diameter of the specimen, E is Young's

Card 1/2

STARODUBTSEV, S.V.; ABLYAYEV, Sh.A.; KEYTLIN, L.G.

Study of molecular transformations in a natural gas caused by electrodeless high-frequency discharges. Izv. AN Uz. SSR. Ser. fiz.-mat. nauk 6 no.5:50-57 '62. (MIRA 15:11)

1. Fiziko- tekhnicheskiy institut AN UzSSR.
(Gas, Natural) (Electric discharges)

STARODUBTSEV, S.V.; ABLYAYEV, Sh.A.; BAKHRAMOV, F.; ZIYATDINOV, Sh.; KEYTLIN, L.G.

Study of molecular transformations in a natural gas caused by electrodeless high-frequency discharges. Part 2. Effect of certain physical factors and impurities on electric cracking. Izv. AN Uz. SSR. Ser. fiz.-mat. nauk 6 no.5:58-65 '62. (MIRA 15:11)

1. Fiziko-tekhnicheskiy institut AN UzSSR.
(Cracking process)

VASIL'YEVA, Ye.K.; STARODUBTSEV, S.V.

Simultaneous adsorption of hydrogen and oxygen on silica gel.
Izv. AN Uz. SSR. Ser. fiz.-[redacted] nauk 6 no.5:66-68 '62.
(MIRA 15:11)

1. Fiziko-tekhnicheskiy institut AN UzSSR.
(Silica) (Hydrogen) (Oxygen)